



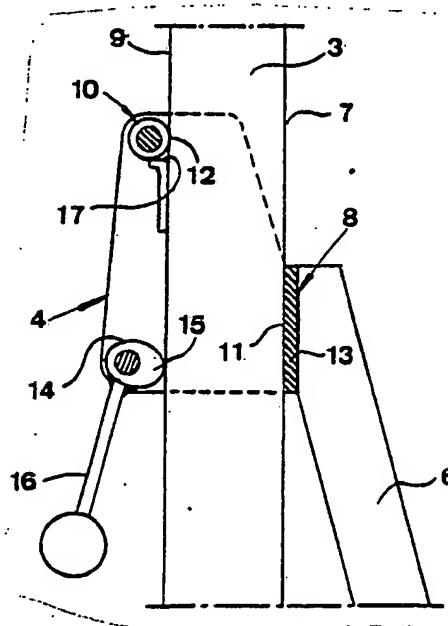
## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification<sup>4</sup> :</b>  <b>A61G 7/10</b>	<b>A1</b>	<b>(11) International Publication Number:</b> <b>WO 85/ 01874</b>  <b>(43) International Publication Date:</b> 9 May 1985 (09.05.85)
<b>(21) International Application Number:</b> PCT/SE84/00338 <b>(22) International Filing Date:</b> 15 October 1984 (15.10.84) <b>(31) Priority Application Number:</b> 8305877-6 <b>(32) Priority Date:</b> 26 October 1983 (26.10.83) <b>(33) Priority Country:</b> SE  <b>(71) Applicant (for all designated States except US):</b> SAM-ARITE AB [SE/SE]; Box 2040, S-871 02 Härnösand (SE). <b>(72) Inventor; and</b> <b>(75) Inventor/Applicant (for US only) :</b> MÄHLER, Sven [SE/SE]; Theodor Hellmans väg 66, S-871 00 Härnösand (SE).  <b>(74) Agent:</b> BJERKÉN, Jarl, Håkan; Gävle Patentbyrå AB, Box 304, S-801 04 Gävle 1 (SE).		<b>(81) Designated States:</b> AT (European patent), BE (European patent), CH (European patent), DE (European patent), DK, FI, FR (European patent), GB (European patent), LU (European patent), NL (European patent), NO, SE (European patent), US.  <b>Published</b> <i>With international search report.</i>

**(54) Title:** A DEVICE FOR ADJUSTABLE LOCKING OF A CARRYING MEMBER TO A POST

**(57) Abstract**

A device for adjustable locking of a carrying member (4) to a post (3), the centre of gravity resulting from the own weight of the carrying member and possible other weight on the same being intended to be displaced away from the centre line of the post in a direction towards or past the first side (7) of the post so that the carrying member receives a tendency to pivot in a first direction relative to the post, comprises a first support (8) arranged on the carrying member on said first side of the post, and a second support (10) arranged on the carrying member for application against the opposite second side (10) of the post. The first and the second supports (8 and 10) are firmly arranged on the carrying member. The first support (8) has a support portion (11), which is intended for application against the post, disposed under a support portion (12) of the second support (10) which latter portion (12) is intended for application against the post. A locking member (14) is arranged on the carrying member, said locking member having a locking portion (15) operable towards the post for locking and away therefrom for releasing, said locking portion (15) being intended for application against the second side (9) of the post at a level under the support portion (12) of the second support.



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A device for adjustable locking of a carrying member  
to a post

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FIELD OF INTENTION AND PRIOR ART

- 5 This invention relates to a device of the kind defined  
in the preamble of claim 1. The post consists preferably  
of a vertically adjustable part of an apparatus carried  
by wheels for handling disabled persons, while the carrying  
member is comprised in a carrying structure for carrying  
a person.
- 10 In such apparatus the need of adjusting the carrying  
structure in markedly different elevation positions  
often arises. Although it would be possible to design  
the post and the components taking care of its movability  
so that the desired range of movement is obtained,  
15 such an embodiment would tend to be relatively bulky,  
complicated and costly. Therefore, it has been suggested  
to design the carrying member adjustably lockable  
to the post in different elevation positions. By the  
combination of the movement of the post relative to  
20 the transport apparatus and the movement of the carrying  
member relative to the post one achieves a satisfactory  
range of movement. In the known embodiment the  
second support consists of a clamp gripping about the  
post, the outer ends of the clamp being fixable to the  
25 carrying member via a screw joint. For releasing the  
carrying member from the post some sort of tool is  
necessary for operating the screws. Thus, it is a  
relatively difficult work to adjust the position of  
the carrying member in relation to the post.
- 30 In another known embodiment corresponding in substance  
to the preamble of claim 1, the carrying member has the  
character of a bush. Thus, parts of the bush form the  
supports and the support portions in question. A  
locking member in the form of an eccentric enables



locking of the bush relative to the post. A drawback with this known embodiment is that the security against unintentional lowering of the carrying member along the post only is dependent on an irreproachable operation or absence of unintentional releasing of the locking member.

#### BRIEF DESCRIPTION OF THE INVENTION

The object of the invention is to reduce the above discussed drawbacks and to achieve an embodiment which is comparatively simple and which despite this allows a relatively quick and easy adjustment of the position of the carrying member along the post at the same time as an improved safety against unintentional lowering of the carrying member will be obtained.

This object is achieved according to the invention by letting the device receive the characteristics defined in the following claims.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Referring to the appended drawings, below follows a closer description of an embodiment according to the invention illustrated as an example.

In the drawings:

Fig 1 is a view from behind of a transport vehicle designed according to the invention,

Fig 2 is a view of the vehicle from its one side,

Fig 3 is a partly cut detail view illustrating the carrying member fastened to the post, and

Fig 4 is a view similar to Fig 3 but showing the carrying member during adjustment of its position along the post.



## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

In the drawings a vehicle including a chassis 1 provided with wheels is illustrated. The chassis 1 carries a pillar 2, on which a post 3 is vertically movably arranged. A carrying member 4 is locked to the post and is included in a carrying structure 5 for carrying a disabled person. The carrying structure has in the example the character of a chair which is firmly connected to the carrying member 4 via a carrying arm 6. The carrying structure 5 could also consist of a bed device.

The centre of gravity of the carrying member 4 and the carrying structure 5 connected thereto is displaced away from the center line of the post in a direction towards or past a first side 7 of the post so that the carrying member receives a tendency to pivot in a first direction (clockwise in Fig 2) relative to the post. As a consequence of the carrying structure 5 having its surface for carrying the person located beside the post 3 the weight from a person sitting on the carrying structure will further tend to displace the centre of the gravity of the assembly consisting of the person, the carrying member 4 and the carrying structure 5 in a direction away from the center line of the post 3.

The carrying member 4 has a first support 8 arranged on the first side 7 of the post 3 and a second support 10 for application against the outer side of the post arranged on the opposite side 9 of the post. These supports 8 and 10 are firmly arranged on the support member 4. With "firmly arranged" it should be understood that the supports in question when locking



and releasing respectively of the carrying member normally are fixed on the carrying member and accordingly they do not require any frequent manipulation; on the other hand it is not beyond the scope of this invention to arrange the supports 8 and 10 adjustable although then a performed adjustment has a more permanent character.

The first support 8 has a support portion 11, which is intended for application against the post, disposed under a support portion 12 of the second support 10, which latter portion 12 is intended for application against the post. In the example the support portion 11 consists of that surface of a plate 13 facing towards the post, while the support 10 has a cylindric outer surface and thus it results in a line-like contact with the side 9 of the post.

On the carrying member 4 is arranged a locking member 14, which has a locking portion 15 operable towards the post for locking and away therefrom for releasing. The locking portion 15 is intended for application against the side 9 of the post at a level under the support portion 12 of the support 10. The locking portion 15 is intended for application against the side 9 opposite to or below the support portion 11 of the support 8.

The locking member 14 is actuated to locking position by influence of gravity. More precisely, the locking member consists of a pivotally journalled eccentric, the projecting eccentric portion of which constitutes the locking portion 15. An operating member 16 is connected to the eccentric 14 so that a movement downwardly of the operating member to a lower position (see Fig 2 and 3) results in operation of the eccentric 14 into a



locking position. The assembly eccentric/operating member has thus its centre of gravity so located that the force of gravity actuates the assembly from the releasing position (see Fig 4) into the locking position (Fig 3). This means security for that the eccentric is going to the locking position even if the operator would forget to actively actuate the operative member in the locking direction.

On the post 3 several separated ledges 17, intended to constitute bearing means for the support 10, are arranged. The ledges are formed by plate pieces fastened on the side 9 of the post.

The supports 8 and 10 extend between two vertical plates 18, between which also a pivot axis 19 for the eccentric 14 is extending. The carrying arm 6 is fastened to the plate 13 formed by the support 8.

In using the device according to the invention, the operator can adjust the carrying member 4 so that it rests on the ledge 17 corresponding to the desired range of movement for the carrying structure 5. Transferring between different ledges is so performed that the operator with one hand is gripping about the operating member 16 and is bringing this to the position according to Fig 4, where the eccentric 14 is located in "releasing" position. This position means that the carrying member 4 is pivotable in a limited manner in a direction anti-clockwise (compare Fig 3 and 4) so that the distance between the support portions 11 and 12 projected on a horizontal plane increases (Fig 4) compared to the corresponding distance in a locked position (Fig 3). The operator achieves this pivoting of the carrying member 4 by gripping with the other hand somewhere in the car-



rying structure 5. The carrying member 4 and accordingly the whole carrying structure 5 can now be displaced upwardly or downwardly along the post while the support 10 can pass the different ledges 17. When the carrying member 4 is adjusted so that the support 10 is located above the intended ledge 17 the operator releases the carrying structure so that the support 10 will come to rest on the ledge in question. Thereafter the operating member 16 is brought/released so that the eccentric 14 reaches the locking position illustrated in Fig 3, where the carrying member 4 is effectively locked relative to the post. The own weight of the carrying structure 5 and the weight on this will cause a torsional movement on the carrying member 4 in the clockwise direction so that thus the supports 8 and 10 are actuated against the sides 7 and 9 of the post respectively. The eccentric 14 operates as a locking which prevents that a tendency to pivoting anti-clockwise of the carrying member 4 relative to the post causes release of support 10 from the ledge 17. It is possible to form the eccentric 14 so that it powerfully presses against the side 9 of the post in the locking position. It is also possible to form the eccentric 14 so that it, when it is in its locking position, lies relatively free and allows a certain limited pivoting of the carrying member 4 in a direction towards the position according to Fig 4 before the projecting portion 15 of the eccentric will be applied against the side 9 of the post. This limited possibility of pivoting in the locking condition of the eccentric may of course not be so large that the support 10 can come out of the engagement with the ledge 17. It is obvious that the invention can be modified in several ways within the range of the spirit of the invention. As an example, the locking member 14 could be





formed for application against the side 7 of the post at a level above the support portion of the support 8, while the locking member preferably is arranged to be applicable against said side 7 of the post opposite or above the support portion 12 of the support 10. Further it would be possible to form the locking member in another way than as an eccentric. The locking member could further be actuated to a locking position by one or several springs, while the design could be such that the gravity has no influence on the operation of the locking member. The number of ledges 17 may of course be varied dependent on the required range of work, the length of the post and its possibility of movement. Further, it would also be possible to apply the invention in other connections than for carrying disabled persons. In the example, the post has an outer rectangular shape in cross section; also other shapes such as round, oval or the like are possible, whereby corresponding adaptation of the supports 8, 10 is suitable.

According to an alternative embodiment of the invention the eccentric constituting the locking member could be replaced with a locking member having a locking portion which was movable towards and away from the post by means of a screw/nut-device.



CLAIMS

1. A device for adjustable locking of a carrying member (4) to a post (3), the centre of gravity resulting from the own weight of the carrying member and possible other weight on the same being intended to be displaced away from the center line of the post in a direction towards or past a first side (7) of the post so that the carrying member receives a tendency to pivot in the vertical plane in a first direction relative to the post, said carrying member having a first support (8) on said first side (7) of the post and a second support (10) for application against the outer side of the post on an opposite second side (9) of the post, the first support (8) having a support portion (11), which is intended for application against the post, disposed under a support portion (12) of the second support (10), which latter portion (12) is intended for application against the post, so that said support portions can counteract said tendency of pivoting by application against the post, a locking member (14) being arranged on the carrying member, said locking member having a locking portion (15) operable for locking and releasing the carrying member (4), said locking portion being intended for application against the post when being in locking position and allowing displacement of the carrying member (4) along the post when being in releasing position, characterized in that at least two ledges (17) separated in the longitudinal direction of the post (3) are arranged on the post and intended to constitute bearing means for the second support (10) of the carrying member (4), and in that the locking member (14), the locking portion (15) of which, in locking position, is intended for application against the first side (7) of the post at a level



above the support portion (11) of the first support (8) or, as an alternative, is intended for application against the second side (9) of the post (3) at a level below the support portion (12) of the second support (10), is adapted, in releasing position, to allow but, in locking position, to prevent pivoting of the carrying member (4) in the vertical plane in a second direction opposite said first direction so that the distance between the support portions (11, 12) of the first and the second supports (8, 10) projected on a horizontal plane increases to such an extent that the second support (10) can be brought past the ledges (17).

2. A device according to claim 1, characterized in that the locking portion is intended for application against the first side (7) of the post opposite or above the support portion (12) of the second support (10).

3. A device according to claim 1, characterized in that the locking portion (15) is intended for application against the second side (9) of the post (3) opposite or below the support portion (11) of the first support (8).

4. A device according to claim 1, characterized in that the locking member (14) is actuated to locking position by influence of gravity and/or at least one spring.

5. A device according to claim 1, characterized in that the locking member (14) consists of a pivotally journaled eccentric, the projecting eccentric portion (15) of which constitutes the locking portion.

6. A device according to claim 5, characterized in that an operating member (16) is connected to the eccentric (14) so that a movement downwardly of the operating member results in operation of the eccentric into a locking position, and in that the assembly



eccentric/operating member has its centre of gravity so located that the force of gravity actuates the assembly into the locking position.

5 7. A device according to claim 5, c h a r a c t e -  
r i z e d in that the first and the second supports  
(8, 10) extend between two vertical plates, between which  
also a pivot axis (19) for the eccentric extends.

8. A device according to claim 1, c h a r a c t e -  
r i z e d in that the first support (8) consists of  
10 a plate, to which a carrying arm (6) is fastened.

9. A device according to claim 1, c h a r a c t e -  
r i z e d in that the post (3) consists of a vertically  
adjustable part of an apparatus for handling disabled  
persons, while the carrying member (4) is comprised in  
15 a carrying structure (5) for carrying a person.



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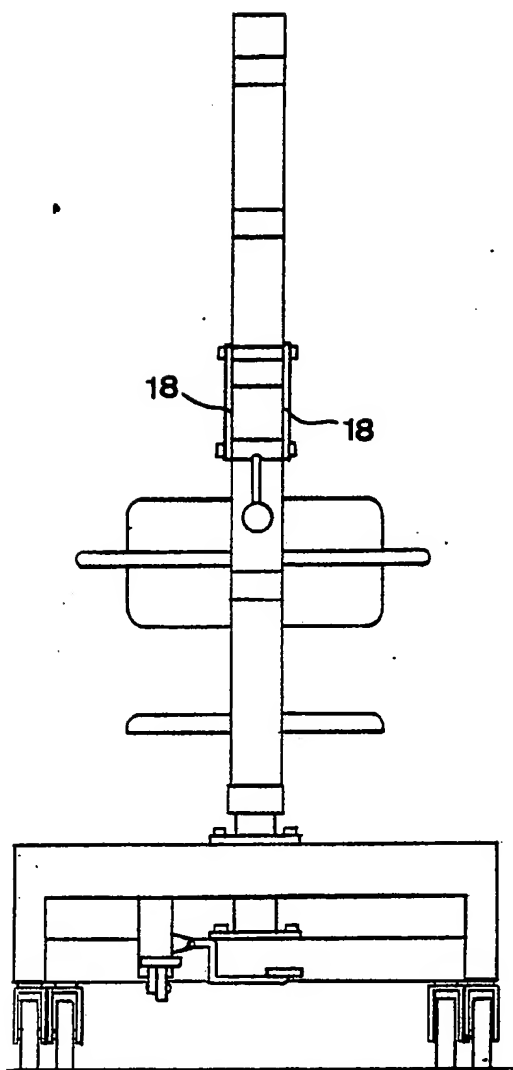


FIG 1

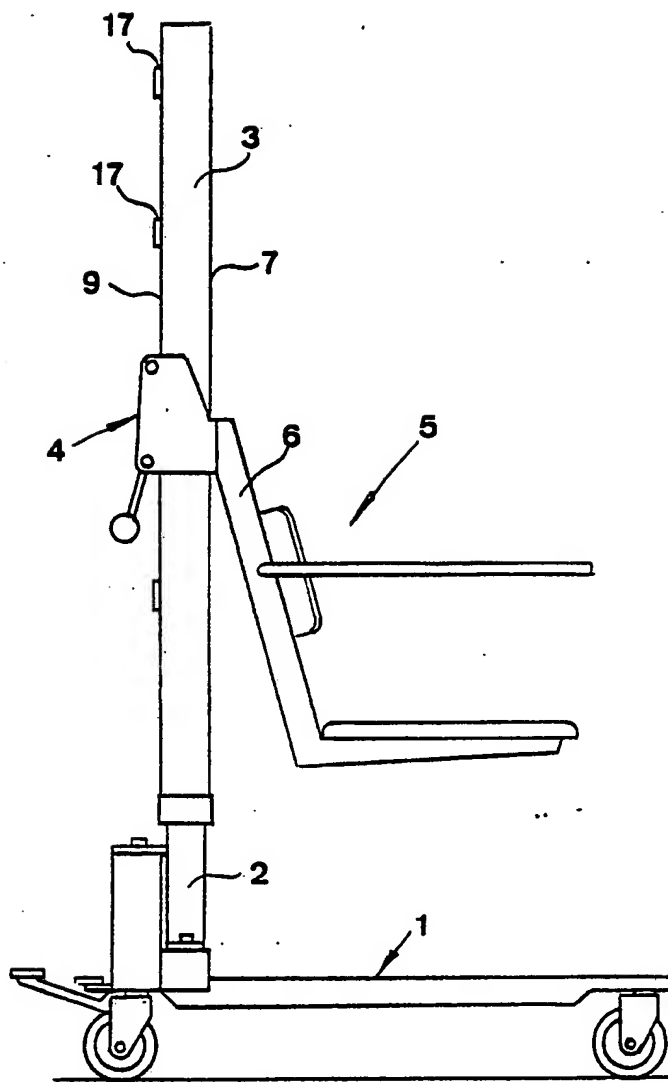


FIG 2

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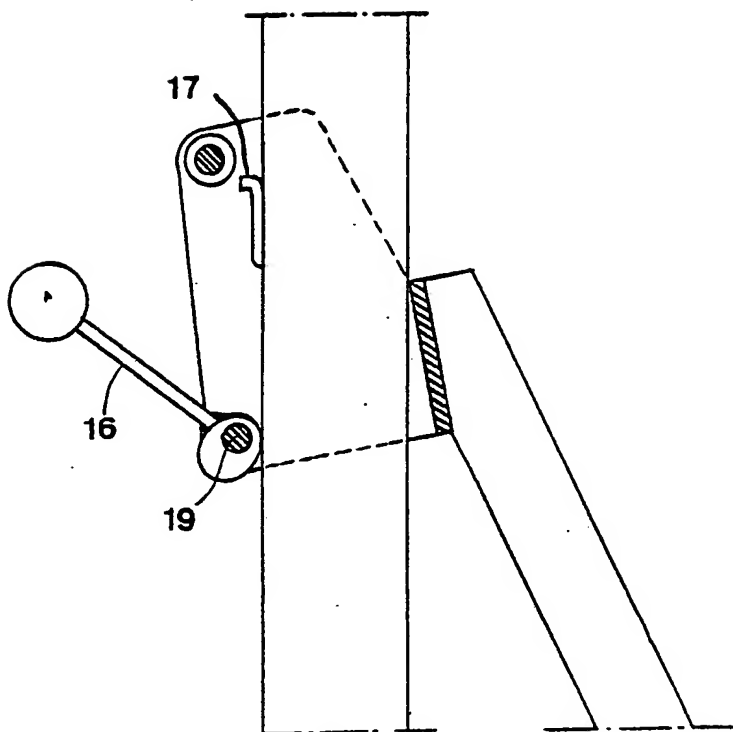


Fig 4

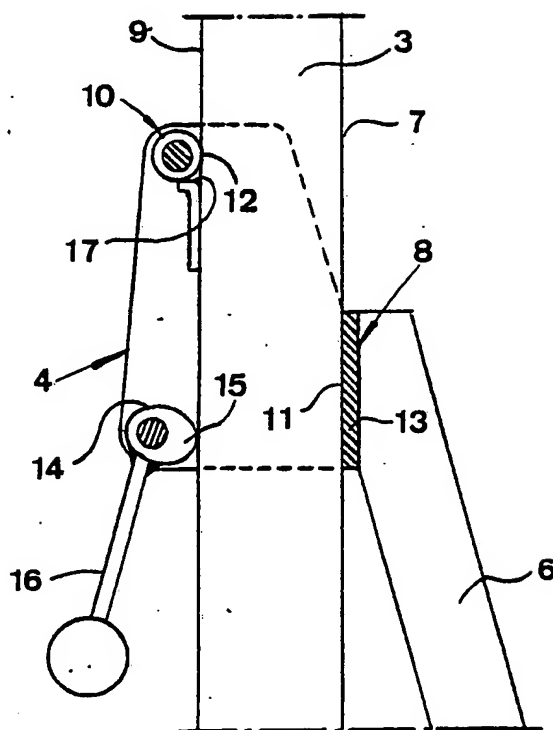





Fig 3

# INTERNATIONAL SEARCH REPORT

International Application No PCT/SE84/00338

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (If several classification symbols apply, indicate all) <sup>1</sup> According to International Patent Classification (IPC) or to both National Classification and IPC <sup>4</sup> <div style="text-align: center; margin-top: 10px;">A 61 G 7/10</div>														
<b>II. FIELDS SEARCHED</b> <div style="text-align: center; margin-top: 10px;">Minimum Documentation Searched <sup>6</sup></div> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 20%;">Classification System</th> <th style="width: 80%;">Classification Symbols</th> </tr> <tr> <td style="padding: 5px;">IPC</td> <td style="padding: 5px;">A 47 B 57/54, 56, 96/12; A 47 C 3/03, 20, 28; A 61 G 1/02, 7/08, 10, 12/00</td> </tr> <tr> <td style="padding: 5px;">US C1</td> <td style="padding: 5px;">4:185, 496; 5:81, 83-86; 248:245, 246, 407-414; 297:296-298</td> </tr> </table> <div style="text-align: center; margin-top: 10px;">Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched <sup>6</sup></div> <div style="margin-top: 20px;">SE, NO, DK, FI classes as above</div>			Classification System	Classification Symbols	IPC	A 47 B 57/54, 56, 96/12; A 47 C 3/03, 20, 28; A 61 G 1/02, 7/08, 10, 12/00	US C1	4:185, 496; 5:81, 83-86; 248:245, 246, 407-414; 297:296-298						
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<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT</b> <sup>14</sup> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 10%;">Category <sup>5</sup></th> <th style="width: 60%;">Citation of Document, <sup>14</sup> with indication, where appropriate, of the relevant passages <sup>17</sup></th> <th style="width: 30%;">Relevant to Claim No. <sup>18</sup></th> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 5px;">A</td> <td style="padding: 5px;">SE, A, 8101414-4 (T LARSSON) 6 September 1982</td> <td style="text-align: center; vertical-align: top; padding: 5px;">1</td> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 5px;">A</td> <td style="padding: 5px;">US, A, 1 826 643 (H E ANDERSON) 6 October 1931</td> <td style="text-align: center; vertical-align: top; padding: 5px;">1</td> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 5px;">A</td> <td style="padding: 5px;">US, A, 2 342 427 (H J RIBLET) 22 February 1944</td> <td style="text-align: center; vertical-align: top; padding: 5px;">1</td> </tr> </table>			Category <sup>5</sup>	Citation of Document, <sup>14</sup> with indication, where appropriate, of the relevant passages <sup>17</sup>	Relevant to Claim No. <sup>18</sup>	A	SE, A, 8101414-4 (T LARSSON) 6 September 1982	1	A	US, A, 1 826 643 (H E ANDERSON) 6 October 1931	1	A	US, A, 2 342 427 (H J RIBLET) 22 February 1944	1
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<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><sup>15</sup> Special categories of cited documents: <sup>16</sup></p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance.</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"A" document member of the same patent family</p> </div> </div>														
<b>IV. CERTIFICATION</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;">           Date of the Actual Completion of the International Search <sup>1</sup>  <div style="text-align: center; margin-top: 10px;">1984-12-28</div> </td> <td style="width: 50%; padding: 5px;">           Date of Mailing of this International Search Report <sup>2</sup>  <div style="text-align: center; margin-top: 10px;">1985-01-09</div> </td> </tr> <tr> <td style="width: 50%; padding: 5px;">           International Searching Authority <sup>3</sup>  <div style="text-align: center; margin-top: 10px;">Swedish Patent Office</div> </td> <td style="width: 50%; padding: 5px;">           Signature of Authorized Officer <sup>10</sup>  <div style="text-align: center; margin-top: 10px;">               Nils Andersson           </div> </td> </tr> </table>			Date of the Actual Completion of the International Search <sup>1</sup> <div style="text-align: center; margin-top: 10px;">1984-12-28</div>	Date of Mailing of this International Search Report <sup>2</sup> <div style="text-align: center; margin-top: 10px;">1985-01-09</div>	International Searching Authority <sup>3</sup> <div style="text-align: center; margin-top: 10px;">Swedish Patent Office</div>	Signature of Authorized Officer <sup>10</sup> <div style="text-align: center; margin-top: 10px;">               Nils Andersson           </div>								
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